

## DSL PROTECTOR HAVING A DETACHABLE WIRE INTERFACE

### BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to digital subscriber line (DSL) protection devices and in particular to a DSL protection device having a detachable wire interface.

[0002] Protection devices are used to protect communication paths such as voice and data communication paths from surges (e.g., over-voltage and/or over-current conditions). Existing protection devices may use gas tube and/or solid state protection mechanisms (e.g., varistors) to provide surge protection. Such devices include a number of wires hard wired to the protection components and a plurality of pins for mating the protection device with a socket.

[0003] A drawback to existing protection devices is that the hard wiring significantly complicates the ability to service the protection device. In a typical situation, service is corrupted or interrupted on a communication path including the protection device. A technician may diagnose the service problem as relating to the protection device, but due to the hard wiring the initial technician cannot replace the protection device. A second technician, such as a DSL technician, is needed to re-wire a new protection device as most technicians do not carry the tools and hardware needed for rewiring. This need for two technicians complicates the service process and unduly delays resolving the problem.

## SUMMARY OF THE INVENTION

[0004] An embodiment of the invention is a digital subscriber line (DSL) protection device. The DSL protection device includes a housing and protection components with the housing providing at least one of over-voltage and over-current protection. An input twisted wire pair and an output twisted wire pair carry DSL signals. A wire interface in the housing is in electrical communication with the protection component. The wire interface detachably secures and makes electrical contact with the input twisted wire pair and the output twisted wire pair.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Referring to the exemplary drawings wherein like elements are numbered alike in the accompanying Figures:

[0006] FIG. 1 depicts an exemplary protection device in a transmission path;

[0007] FIG. 2 depicts a protection device in an exemplary embodiment;

[0008] FIG. 3 depicts an exemplary detachable interface for wires;

[0009] FIG. 4 depicts a protection device in another exemplary embodiment.

## DETAILED DESCRIPTION OF THE INVENTION

[0010] FIG. 1 depicts an exemplary protection device 10 in a transmission path. The protection device 10 is placed in a transmission path between a telecommunications service provider (e.g., DSL and voice) and an end user. The protection device 10 provides protection against surge conditions such as over-voltage and/or over-current.

[0011] The transmission path includes an input twisted wire pair 14 and an output

twisted wire pair 20 carrying telecommunications signals (e.g., DSL signals, voice signals). The input twisted wire pair 14 is connected to another input twisted wire pair 16 through protection device 10. The output twisted wire pair 20 is connected to another output twisted wire pair 18 through protection device 10. The protection device 10 may be positioned in a variety of locations such as a central office (CO) of the service provider, a remote terminal, a DSLAM, etc.

[0012] The protection device 10 is mounted in a socket 12 to establish the connection between the input/output twisted wire pairs 14/20 and input/output twisted wire pairs 16/18. As shown in FIGS. 2 and 4, the protection device 10 includes a number of pins that engage receptacles in socket 12. The input twisted wire pair 14 and the output twisted wire pair 20 are detachable from the protection device 10 rather than hard-wired. Detachable refers to a connection that may be established or removed using no tools or minimal tools (e.g., screwdriver, allen wrench).

[0013] FIG. 2 depicts protection device 10 in one embodiment of the invention. The protection device 10 includes a housing 50 including protection components 52. The protection components 52 may be one or more known components (such as a gas tube, solid state device) that provide over-voltage and/or over-current protection. The protection components 52 are in electrical communication with the input twisted wire pair, the output twisted wire pair and pins 28.

[0014] The input twisted wire pair 14 and the output twisted wire pair 20 are detachably secured to the protection device at wire interface 22 which is in electrical communication with protection components 52 and pins 28. The wire interface 22 may use a variety of techniques to detachably secure and make electrical contact with input twisted wire pair 14 and the output twisted wire pair 20. FIG. 3 shows one

exemplary wire interface including a conductive threaded post 24 and a conductive nut 26. A wire is received in an opening in the post 24. A post is provided for each wire in input twisted pair 14 and output twisted pair 20. Other detachable wire interfaces may be used such as conductive spring clamps, terminal blocks, conductive set screws, etc.

[0015] The protection device 10 includes five pins 28 including one ground pin and a pin for each wire. The twisted wire pairs include a tip wire and a ring wire. Thus, the five pins 28 correspond to input tip wire, input ring wire, output tip wire, output ring wire and ground.

[0016] FIG. 4 depicts a protection device 40 in another exemplary embodiment. In this embodiment, the detachable wire interface is provided through a plug and outlet. The protection device 40 includes a modular outlet 32 in electrical connection with the protection components 52 and pins 28. Twisted wire pair 14 and twisted wire pair 20 are connected to a modular plug 34. In an embodiment of the invention, the modular outlet 32 and modular plug 34 are RJ-45 type devices. It is understood that other plug and outlet formats may be used.

[0017] The detachable wire interface provided on the protection device allows the protection device to be removed from the input twisted wire pair and the output twisted wire pair easily. This allows a technician to remove and replace the protection device using no or minimal tools.

[0018] While the invention has been described with reference to exemplary embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be

made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims. Moreover, the use of the terms first, second, etc. do not denote any order or importance, but rather the terms first, second, etc. are used to distinguish one element from another. Furthermore, the use of the terms a, an, etc. do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced item.